

Rabies and Other Infectious Diseases of Dogs and Cats

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The most important infectious diseases affecting both dogs and cats are rabies and toxoplasmosis. They are discussed in this chapter along with several other infections.

Rabies is one of the oldest recorded diseases in history and dates back to the Promosaic Eshunna Code which was written in about 2300 B.C. It is caused by an RNA virus which causes infection in all warmblooded animals.

The virus can be found in nerve tissue, saliva and salivary glands, the pancreas, less often in urine and lymph, rarely in milk, and in other

body fluids of infected animals. Rabies is more prevalent in temperate zones and when large numbers of unvaccinated dogs and cats are present.

Rabid dogs and cats are the main source of human infections. Wild animals such as rabid skunks, foxes, raccoons, coyotes, bats, and bobcats are other infection sources.

Spread of rabies most commonly is by the bite of an infected animal, through presence of the virus in the saliva. Broken skin of the bite wound allows the rabies virus to get into the body where it can flourish.

Once inside the body the virus is drawn to the nerves and follows nerve fibers to the brain and salivary glands. After the virus infects the brain it reproduces rapidly, causing severe brain damage. The brain lesions lead to altered behavior, aggressiveness, progressive paralysis,

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and in most species death.

After the virus gets into the salivary glands, the infected animal can spread the virus by way of its contaminated saliva to susceptible animals.

Signs of the Disease

Not all rabid animals show the same signs of the disease. Some animals will ultimately show the classic "mad dog" behavior while others may withdraw fearfully to a dark, sheltered place.

A usually quiet, friendly cat may suddenly become aggressive and attack every moving object or person. A skunk, which normally moves at night, may appear in broad daylight and act as if it wants to be petted. A bat may be lying on a playground or sidewalk and bites when picked up.

Other than the altered behavior states, there are no specific signs which say that these animals are infected with rabies virus.

Diagnosis of rabies usually is based on the history and physical examination. A history of abnormal behavior, the suspected animal's involvement in a fighting or biting episode, presence of rabies in the area, and the dog's or cat's vaccination record can

be used as supportive information for diagnosing rabies.

Confining Dogs, Cats

Any unprovoked attack by an animal should suggest the possibility of rabies. Dogs and cats that are rabies suspects should be confined to a cage where they can be observed and fed without risk.

No acceptable diagnostic tests can be used to evaluate a live dog or cat for rabies. All laboratory tests for rabies are presently done on the dead animal.

The preferred technique to diagnose rabies is by using fluorescent antibody tests and by injecting brain tissue of the suspect animal into the brains of mice. Rabies virus will cause the death of the injected mice.

The inoculation test of mice is very sensitive for detecting the presence of rabies virus and has potentially saved many people from dying of rabies.

Act Fast. Although exposure to rabies is a cause for concern, when prompt action is taken there is no cause for panic or hysteria. If you or someone with you is bitten by a rabid animal you should:

- 1) Wash the wound vigorously with soap or detergent and flush it repeatedly with



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If you or someone with you is bitten by an animal you should: Wash the wound thoroughly; contact your physician, veterinarian and local animal control officer and identify the suspected animal so that it can be confined.



large amounts of water

2) Contact your physician as soon as possible about the bite wound and the type of animal that bit you, and

3) Contact your veterinarian or local animal control officer and report the attack.

Keep track of the animal involved in the attack episode and where it can be found. Responsible authorities will either quarantine the animal for observation or kill the animal and check for the rabies virus.

Vaccination. To reduce your exposure to rabies, vaccinate all your dogs and cats and encourage your neighbors to do the same.

Rabies vaccines produced today for use in dogs and cats are both safe and effective. Their costs are relatively inexpensive when compared to the cost of confining an animal for observation or the loss of life of a human being.

Regular rabies vaccination every one to three years should be a part of any responsible pet health program. A dog or cat is never too old for a rabies vaccination.

No vaccines have been tested or approved for use in any wildlife species. Vaccination of wildlife species may cause rabies or death of the animal.

Toxoplasmosis

This disease is caused by infection with *Toxoplasma gondii* and occurs throughout the world. Infection has been observed in a wide range of birds and mammals.

Toxoplasma organisms living in body cells of the host cause illness when they escape these body cells. Cats are the primary host but other mammals and birds may also be infected.

Animals acquire the toxoplasma organism by eating infected raw meat or by ingestion of contaminated feces. Some species can also acquire the toxoplasma infection during pregnancy which may infect the developing fetus.

Human infections with *Toxoplasma gondii* can occur both prenatally and postnatally. The two postnatal modes of transmission are by the ingestion of infected raw or undercooked meat or feces.

Inadvertent ingestion of organisms in feces is usually related to contact with cat litter boxes or contaminated soil.

Prenatal transmission occurs when a woman acquires the infection during pregnancy. Fetuses appear to be at great risk to toxoplasmosis during late pregnancy.

The great majority of toxoplasmosis infections cause no

apparent illness. The most frequent signs of illness in cats and dogs are associated with infections of the nervous system, eyes, respiratory tract, and gastrointestinal system.

Cats may experience fever, jaundice, enlarged lymph nodes, difficulty in breathing, anemia, eye inflammation, abortion, encephalitis and intestinal disease. Cats may also develop stiff, painful muscles from the infections so that they are unable to move.

Pneumonia, liver disease, and ocular, nervous system, and muscle damage may result as signs of illness in the dog.

Diagnosis of toxoplasmosis based on history and signs of illness alone is usually not possible because of the wide variety of signs of illness that can occur. Identification of toxoplasma organisms in the feces of infected cats is possible in early infections but only are excreted for one to two weeks.

Laboratory tests currently used in the detection of *Toxoplasma gondii* antibodies are generally preferred to the identification of organisms in feces. Presence of toxoplasma antibodies suggests that the animal may be immune to infection.

Lack of antibodies usually

indicates the animal is susceptible and could shed or be shedding organisms in the feces. If a rise in antibody titer occurs over a 2 to 4 week period of time the test indicates the animal may be infected.

Vaccination of animals against toxoplasmosis is not possible at the present time.

Avoiding Infection

Some recommendations can be made to prevent ingestion of infected meat and to minimize exposure to contaminated feces.

To prevent infections of cats and other animals, confine the animals to their home environment, avoiding exposure sources. Feed animals only commercial or well-cooked meat and never feed raw meat to cats and dogs.

Change cat litter boxes frequently and dispose of the feces so that no animals or man will come in contact with the feces.

For human consumption, cook meat throughout to 66° C (150° F) to destroy any organisms present. Always wash your hands thoroughly after handling meat.

Wear gloves while gardening, especially in areas favored by cats for defecation, and when changing cat litter



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Two keys to preventing infections in your dogs and cats are: A) Never feed raw meat to them; choose a commercial feed or well-cooked meat as part of a well-planned balanced diet. B) Change cat litter boxes frequently and dispose of the feces so that no animals or people will come in contact with them.

boxes. Cover children's sandboxes when not in use so cats cannot defecate in them. Encourage children to always wash their hands thoroughly before eating.

To reduce the risk of infection, pregnant women should not eat undercooked meat and should avoid all contact with cat feces.

Salmonellosis

Salmonella species are ubiquitous bacterial organisms that are found in both wild and domestic animals. *Salmonella typhimurium* is the serotype usually isolated from cats and dogs with salmonellosis. It is usually spread by ingestion of the organism in food contaminated by infected feces.

An outbreak of infections in dogs or cats may be initiated by an animal with an active infection, a carrier animal shedding the organism without showing signs of illness, or a relapse in a carrier animal that has been subjected to stress of illness or surgery.

People who care for and handle animals may be susceptible to the infection from the animals or may transmit the infection to the animals because they are active carriers of the organisms.

Because of the highly con-

tagious nature of the infection, strict attention must be focused on disinfection of the premises and on the personal hygiene of individuals around the animals.

Primary route of infection is by ingestion of the organism. After ingestion the organism invades the bloodstream and establishes infection in the intestinal tract.

The infected animal experiences fever, diarrhea, and vomiting. Dehydration and severe inactivity usually accompany these signs of infection. Early in the infection, the white blood cell numbers may be severely decreased which allows other types of infections to occur.

Salmonellosis can be confused easily with other gastrointestinal diseases such as canine distemper and parvovirus infections. Confirmation of a diagnosis of salmonellosis is made on the history and signs of the infection and the isolation of the organism.

Vaccination of dogs and cats against salmonellosis is not done at the present time. Identification of those animals that serve as carriers of the organisms should be done, and the animals should be treated with antibiotics to decrease

exposure of other animals to the organism.

Haemobartonellosis

This illness is caused by the infection of dogs and cats with *Haemobartonella canis* or *Haemobartonella felis*. Haemobartonella organisms attach tightly to the surface of red blood cells, which causes destruction of red blood cells in an infected animal.

Haemobartonellosis can occur in cats and dogs of all ages. The most common signs associated with the illness are fever, pale mucous membranes, weight loss, and depression. Enlargement of the spleen and jaundice are frequently noted. Infected cats may be predisposed to other infections such as feline leukemia.

The illness has been seen in dogs that have been severely stressed or infected concurrently with *Ehrlichia canis* or have had their spleens surgically removed.

A diagnosis of haemobartonellosis is based on the history and signs of the infection and the demonstration of the haemobartonella organisms on the red blood cells.

The illness is very responsive to antibiotic therapy and most animals survive without permanent damage.

Mycobacterial Ills

Mycobacterial organisms cause several infections in dogs and cats.

Mycobacterium tuberculosis and *Mycobacterium bovis* are the primary organisms that cause tuberculosis in dogs and cats. Animals are infected by inhaling the organisms from respiratory excretions or by drinking infected milk from infected animals.

Infections in dogs and cats are manifested as lung disease and/or draining, non-healing abscesses. Diagnosis of tuberculosis is based on history, signs of the infection, radiographs of the chest, and isolation of the mycobacterial organisms.

Mycobacterium fortuitum, *Mycobacterium smegmatis*, and *Mycobacterium chelonae* can cause draining, nonhealing abscesses or tracts in dogs and cats that have been present for months to years. Except for the obvious lesions the affected animals are normal.

Sometimes local pain is noted and diagnosis is made by isolating the organisms from the lesions. Surgical removal of the lesions is the preferred treatment.

Response to antibiotic therapy is poor in infections involving these organisms.

Campylobacteriosis

This disease is caused by infection with *Campylobacter jejuni*. The organisms are spread to susceptible animals by direct contact with infected animals or consumption of contaminated water and food of animal origin.

The organism has been isolated from human feces and has caused diarrhea in people. Origin of the human campylobacter organisms has been blamed on infected dogs and cats.

Symptoms in animals

with campylobacteriosis are loss of appetite, inactivity and mild diarrhea. Diagnosis of the disease is based on the history, signs of the disease and isolation of the organisms from diarrheic feces.

The disease is responsive to antibiotic therapy. Vaccination for the protection against the disease is not possible at the present time. Simple hygienic measures such as handwashing and isolation of diarrheic animals are helpful in preventing the spread of the disease.